

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (currently amended) A gas sensor manufacturing method comprising the steps of:

preparing an assembly which has a length and includes (a) a housing which has a length made up of a first end portion, a second end portion, and a flange between the first and second end portions, (b) a cover which is made up of a small-diameter portion, a large-diameter portion, and a shoulder formed between the small-diameter portion and the large-diameter portion, (c) a first insulation porcelain disposed in the large-diameter portion of the cover in contact with the shoulder through an elastic member, (d) a second insulation porcelain disposed in the housing in contact of an end thereof with an end of the first insulation porcelain in alignment with each other, and (e) a laminated sensor element disposed in the second insulation porcelain;

pressing the cover against the housing in a lengthwise direction of said assembly to fit an end of the large-diameter portion of the cover on the first end portion of the housing to form an overlap;

tack welding the large-diameter portion of the cover to the first end portion of the housing at the overlap while pressing the cover against the housing;

rotating said assembly about the length thereof; and

welding the large-diameter portion of the cover to the first end portion of the housing over the tack-welded overlap.

2. (previously presented) The gas sensor manufacturing method as set forth in claim 1, wherein said pressing steps presses the cover against the housing while compressing the elastic member to urge the second insulation porcelain against an inner wall of the housing elastically to establish a hermetic seal between an outer wall of the second insulation porcelain and the inner wall of the housing.

3. (previously presented) The gas sensor manufacturing method as set forth in claim 1, wherein said welding step is performed while pressing the cover against the housing.

4. (previously presented) The gas sensor manufacturing method as set forth in claim 1, wherein pressure exerted on the cover is released after the tack welding step.

5. (previously presented) The gas sensor manufacturing method as set forth in claim 1, said welding step is performed by laser welding.

6. (previously presented) The gas sensor manufacturing method as set forth in claim 1, said tack welding step makes at least two tack welds in the overlap of the cover and the housing.

Claims 7 – 23. (cancelled).

24. (currently amended) A gas sensor manufacturing method comprising the steps of:

preparing an assembly which has a length and includes (a) a housing which has a length made up of a first end portion, a second end portion, and a flange between the first and second end portions, (b) a cover which is made up of a small-diameter portion, a large-diameter portion, and a shoulder formed between the small-diameter portion and the large-diameter portion, (c) a first insulation porcelain disposed in the large-diameter portion of the cover in contact with the shoulder through an elastic member, (d) a second insulation porcelain disposed in the housing in contact of an end thereof with an end of the first insulation porcelain in alignment with each other, and (e) a laminated sensor element disposed in the second insulation porcelain;

pressing the cover against the housing in a lengthwise direction of said assembly until a pressure exerted on the housing reaches a given pressure level to fit an end of the large-diameter portion of the cover on the first end portion of the housing to form an overlap; and

welding the large-diameter portion of the cover to the first end portion of the housing at the overlap while pressing the cover against the housing,

wherein said pressing steps press the cover against the housing while compressing the elastic member to urge the second insulation porcelain against an inner wall of the housing elastically to establish a hermetic seal between an outer wall of the second insulation porcelain and the inner wall of the housing, and

wherein said given pressure level is 1.2 times greater than or equal to an elastic pressure produced by the elastic member.

Claims 25 -35. (cancelled)